



USB MIXING STUDIO

**MV10**

OWNER'S MANUAL

BEDIENUNGSANLEITUNG

MODE D'EMPLOI

MANUAL DE INSTRUCCIONES



EN  
DE  
FR  
ES

## IMPORTANT NOTICE FOR THE UNITED KINGDOM

### Connecting the Plug and Cord

IMPORTANT. The wires in this mains lead are coloured in accordance with the following code:

BLUE : NEUTRAL

BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

Making sure that neither core is connected to the earth terminal of the three pin plug.

- This applies only to products distributed by Yamaha-Kemble Music (U.K.) Ltd. (2 wires).

## COMPLIANCE INFORMATION STATEMENT (DECLARATION OF CONFORMITY PROCEDURE)

Responsible Party : Yamaha Corporation of America

Address : 6600 Orangethorpe Ave., Buena Park, Calif. 90620

Telephone : 714-522-9011

Type of Equipment : USB MIXING STUDIO

Model Name : MW10

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received including interference that may cause undesired operation.

See user manual instructions if interference to radio reception is suspected.

\* This applies only to products distributed by  
YAMAHA CORPORATION OF AMERICA.

(FCC DoC)

## FCC INFORMATION (U.S.A.)

### 1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

### 2. IMPORTANT:

When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

### 3. NOTE:

This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does

not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

Relocate either this product or the device that is being affected by the interference.

Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s.

In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA90620

\* This applies only to products distributed by YAMAHA CORPORATION OF AMERICA. (class B)

# PRECAUTIONS

## PLEASE READ CAREFULLY BEFORE PROCEEDING

\* Please keep this manual in a safe place for future reference.



### WARNING

Always follow the basic precautions listed below to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

#### Power supply/Power cord

- Only use the voltage specified as correct for the device. The required voltage is printed on the name plate of the device.
- Use only the specified AC power adaptor (PA-10 or an equivalent recommended by Yamaha).
- Do not place the power cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.

#### Do not open

- Do not open the device or attempt to disassemble the internal parts or modify them in any way. The device contains no user-serviceable parts. If it should appear to be malfunctioning, discontinue use immediately and have it inspected by qualified Yamaha service personnel.

#### Water warning

- Do not expose the device to rain, use it near water or in damp or wet conditions, or place containers on it containing liquids which might spill into any openings.
- Never insert or remove an electric plug with wet hands.

#### If you notice any abnormality

- If the power cord or plug becomes frayed or damaged, or if there is a sudden loss of sound during use of the device, or if any unusual smells or smoke should appear to be caused by it, immediately turn off the power switch, disconnect the electric plug from the outlet, and have the device inspected by qualified Yamaha service personnel.
- If this device or the AC power adaptor should be dropped or damaged, immediately turn off the power switch, disconnect the electric plug from the outlet, and have the device inspected by qualified Yamaha service personnel.



### CAUTION

Always follow the basic precautions listed below to avoid the possibility of physical injury to you or others, or damage to the device or other property. These precautions include, but are not limited to, the following:

#### Power supply/Power cord

- Remove the electric plug from the outlet when the device is not to be used for extended periods of time, or during electrical storms.
- When removing the electric plug from the device or an outlet, always hold the plug itself and not the cord. Pulling by the cord can damage it.
- To avoid generating unwanted noise, make sure there is 50 cm or more between the AC power adaptor and the device.
- Do not cover or wrap the AC power adaptor with a cloth or blanket.

#### Location

- Before moving the device, remove all connected cables.
- Avoid setting all equalizer controls and faders to their maximum. Depending on the condition of the connected devices, doing so may cause feedback and may damage the speakers.
- Do not expose the device to excessive dust or vibrations, or extreme cold or heat (such as in direct sunlight, near a heater, or in a car during the day) to prevent the possibility of panel disfiguration or damage to the internal components.
- Do not place the device in an unstable position where it might accidentally fall over.
- Do not use the device in the vicinity of a TV, radio, stereo equipment, mobile phone, or other electric devices. Doing so may result in noise, both in the device itself and in the TV or radio next to it.

#### Connections

- Before connecting the device to other devices, turn off the power for all devices. Before turning the power on or off for all devices, set all volume levels to minimum.

#### Handling caution

- Do not insert your fingers or hands in any gaps or openings on the device.
- Avoid inserting or dropping foreign objects (paper, plastic, metal, etc.) into any gaps or openings on the device. If this happens, turn off the power immediately and unplug the power cord from the AC outlet. Then have the device inspected by qualified Yamaha service personnel.
- Do not use the device or headphones for a long period of time at a high or uncomfortable volume level, since this can cause permanent hearing loss. If you experience any hearing loss or ringing in the ears, consult a physician.
- Do not rest your weight on the device or place heavy objects on it, and avoid use excessive force on the buttons, switches or connectors.

XLR-type connectors are wired as follows (IEC60268 standard): pin 1: ground, pin 2: hot (+), and pin 3: cold (–).

Insert TRS phone jacks are wired as follows: sleeve: ground, tip: send, and ring: return.

Yamaha cannot be held responsible for damage caused by improper use or modifications to device, or data that is lost or destroyed.

Always turn the power off when the device is not in use.

Even when the power switch is in the “STANDBY” position, electricity is still flowing to the device at the minimum level. When you are not using the device for a long time, make sure you unplug the power cord from the wall AC outlet.

The performance of components with moving contacts, such as switches, volume controls, and connectors, deteriorates over time. Consult qualified Yamaha service personnel about replacing defective components.

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- The supplied disk is a CD-ROM. Do not attempt to play the disk on an audio CD player. Doing so may result in irreparable damage to your audio CD player.
- Visit the web address below for the latest information on supplied software and operating system requirements.  
<<http://www.yamahasynt.com/>>
- The screen displays as illustrated in this owner's manual are for instructional purposes, and may appear somewhat different from the screens which appear on your computer.
- The illustrations as shown in this owner's manual are for instructional purposes only, and may appear somewhat different from those on your device.

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# Foreword

Thank you for choosing a Yamaha MW10 USB Mixing Studio. The MW10 includes an audio mixer equipped with a USB interface for digital audio data transfer, and Cubase LE DAW (Digital Audio Workstation) software for Windows® and Macintosh® computer operating systems. With the MW10 USB Mixing Studio and your personal computer you have the basic elements of a high-performance computer recording system that is easy to set up and operate.

In order to take full advantage of the many features and capabilities provided by the MW10, we urge you to read this owner's manual thoroughly before using your MW10 system, and keep the manual in a safe, accessible location for future reference.

## Features

### Connect To Your Computer via a Single USB Cable (page 7)

The MW10 mixer connects to your computer via the supplied USB cable. Stereo audio data is transferred in both directions—from the mixer to the computer, and vice-versa—via the USB connection (44.1 kHz or 48 kHz sampling frequency).

### No Driver Installation Required (page 7)

The MW10 system uses the standard drivers included in your computer's operating system, so there's no need to install any extra driver software.

### Cubase LE DAW Software Supplied (page 7)

Cubase LE software, included in the MW10 package, offers versatile, high-performance hard-disk recording capability.

### 3-Band EQ On Each Channel (page 15)

Each channel of the MW10 mixer features full 3-band equalization, providing broad, musical response-shaping capability.

### Mixer Functions (page 15)

With up to four mic/line inputs or up to four stereo inputs, the MW10 can simultaneously connect to a wide range of devices: microphones, line-level devices, stereo synthesizers, and more. For example, you can connect two microphones and four stereo devices, or four microphones and two stereo devices.

### 48V Phantom Power (page 16)

A PHANTOM switch supplies +48V phantom power to the mixer's microphone inputs, so you can use high-quality phantom-powered condenser microphones for superior recording quality.

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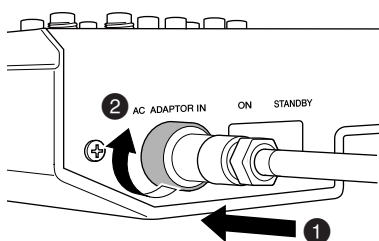
## Before Turning on the Mixer

### 1 Be sure that the mixer's power switch is in the **STANDBY** position.



Use only the PA-10 adaptor included with this mixer. Use of a different adaptor may result in equipment damage, overheating, or fire.

### 2 Connect the power adaptor to the **AC ADAPTOR IN** connector (1) on the rear of the mixer, and then turn the fastening ring clockwise (2) to secure the connection.



### 3 Plug the power adaptor into a standard household power outlet.



- Be sure to unplug the adaptor from the outlet when not using the mixer, or when there are lightning storms in the area.
- To avoid generating unwanted noise, make sure there is 50 cm or more between the power adaptor and the mixer.

## Turning the Power On/OFF

Press the mixer's power switch to the **ON** position. When you are ready to turn the power off, press the power switch to the **STANDBY** position.



Note that trace current continues to flow while the switch is in the **STANDBY** position. If you do not plan to use the mixer again for a long while, please be sure to unplug the adaptor from the wall outlet.

#### NOTE

To prevent loud pops and noises, turn on the power to your sound gear starting with the sources (instruments, CD players, etc.) and ending with the power amplifier or powered speakers.

**Example:** Instruments, microphones, and CD players first, then the mixer, and finally the power amplifier or powered speakers.

When turning off the power to the system, reverse the order described above.

## Computer System Requirements

### Windows

Computer	Windows-based computer with built-in USB interface
OS	Windows XP
CPU	750MHz or higher Intel Pentium/Celeron processor
Memory	More than 96MB (128MB or more recommended)

### Macintosh

Computer	Macintosh computer with built-in USB interface
OS	MacOS X 10.3.3 or higher
CPU	Macintosh G3 processor 300MHz or higher
Memory	More than 128MB

## Cubase LE System Requirements

### Windows

OS	Windows XP
CPU	500 MHz or higher Pentium III or AMD K7 (1GHz or more recommended Pentium III/Athlon)
Memory	More than 256MB (512MB or more recommended)
Hard Disk	1GB or more

### Macintosh

OS	MacOS X 10.3.3 or higher
CPU	Macintosh G4 processor 450MHz or higher
Memory	More than 256MB (512MB or more recommended)
Hard Disk	1GB or more



# Quick Guide

This quick setup and operation guide covers everything from installing the Cubase LE software to using Cubase LE for recording and mixdown. While going through this section you might find it useful to also refer to the “Front and Rear Panels” section on page 15, as well as the pdf manual supplied with the the Cubase LE software.

Step

## 1 Installing Cubase LE

- 1 Turn the computer on.
- 2 Insert the supplied CD-ROM into the computer's CD-ROM drive.

## 3 Follow the on-screen instructions to install the Cubase LE software.

The serial number is printed on the sheet located inside the CD-ROM envelope.

- NOTE**
- Please install Cubase LE while connected to the internet.
  - Please enter all required items during installation.
  - For Macintosh computers double-click the “Cubase LE.pkg” icon.

Step

## 2 Connections

- 1 **Connect the MW10 to the Computer.**  
Connect the MW10 mixer to your computer using the supplied USB cable.

### USB Connection Precautions

Be sure to observe the following points when connecting to the computer's USB interface. Failure to observe these rules can result in computer freezes/hang-ups and possibly data loss or corruption.

If the computer or MW10 does stop operating properly, turn the power off and then on again, and restart the computer.



- Be sure to wake the computer from sleep/suspended/standby mode before making a connection to the computer's USB connector.
- Connect the MW10 to the computer before turning the MW10 power on.
- Always quit all applications running on the computer before turning the MW10 power on or off, or connecting or disconnecting the USB cable.
- Wait at least 6 seconds between turning the MW10 on or off, and between connecting or disconnecting the USB cable.



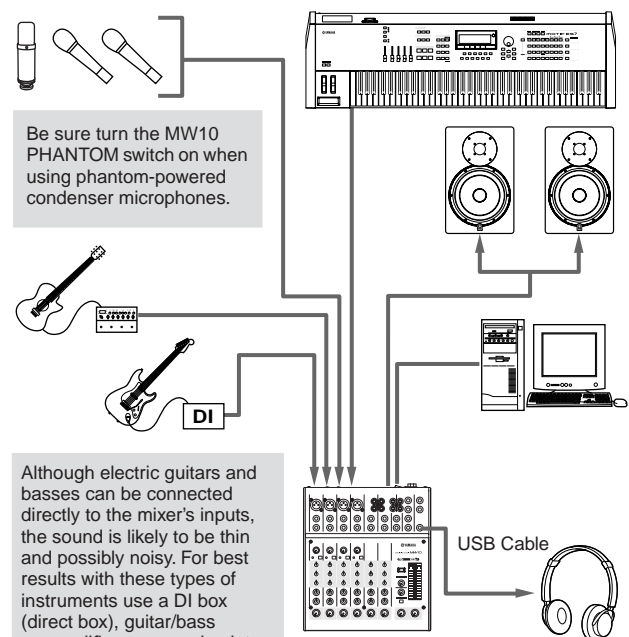
When connecting or disconnecting the USB cable be sure to turn the 2TR IN/USB control all the way down.

**NOTE**

Disconnect the USB cable before you use the computer without the MW10.

## 2 Connecting Microphones and/or Instruments.

For details on making connections refer to the “Input/Output” section on page 17, and the “Setting up” section on page 20.



## Balanced Cables and Unbalanced Cables

Two types of cables can be used to connect microphones, electronic instruments, and other audio sources to the mixer's inputs, as well as to connect the mixer's outputs to a power amplifier or related gear: balanced or unbalanced. Balanced cables are highly resistant to noise, and are the best choice for low-level signals such as the output from microphones, as well as for long cable runs. Unbalanced cables are generally used for short runs from line-level sources such as synthesizers.

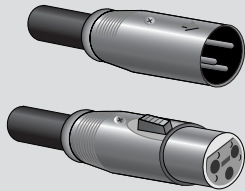
### Cable Guidelines

Microphone cable: Balanced is best.  
 Short line-level cables: Unbalanced cable is fine in a relatively noise-free environment.  
 Long line-level cables: Balanced is best.

### Connector Types

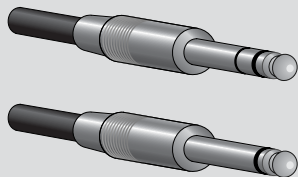
#### XLR Connectors

This 3-pin connector is resistant to externally induced noise, and is used primarily for balanced connections. With properly designed receiving circuitry cables with this type of connector can also be used for unbalanced signals. XLR type connectors are the standard for microphone connections as well as most professional audio gear.



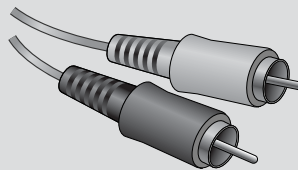
#### Phone Connectors

Phone connectors are available in mono and stereo versions. Stereo types are also known as "TRS" connectors (Tip-Ring-Sleeve), and are used for stereo headphone jacks, insert jacks, and also to carry balanced signals in many cases. Unbalanced types are used for mono signals—guitar cables are a common example.



#### RCA Pin Connectors

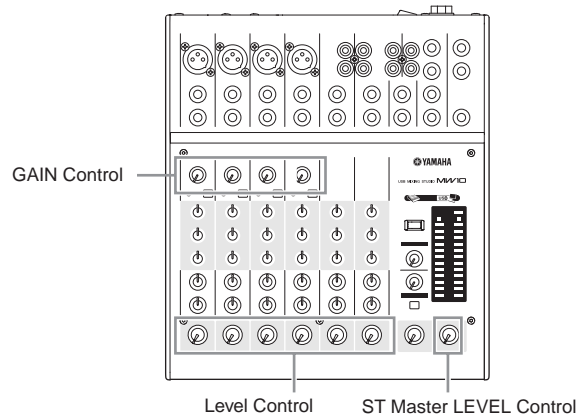
This type of unbalanced connector is most commonly found on home audio and video equipment. RCA type pin jacks are often color coded: white for left audio channel and red for right audio channel, for example.



Step

## 3 Powering Up the System

- 1 Turn the power to all gear that is to be connected to the MW10 off/standby (except the computer), and set the ST Master Level Control, Channel LEVEL Controls, and GAIN Controls to their minimum settings.



- 2 To prevent loud pops and noises, turn on the power to your sound gear starting with the sources (instruments, CD players, etc.) and ending with the power amplifier or powered speakers.

**Example:** Instruments, microphones, and CD players first, then the mixer, and finally the power amplifier or powered speakers.



Observe the following precautions when turning on phantom power.

- Make sure that the PHANTOM switch is off when phantom power is not needed.
- Make sure that no equipment other than phantom-powered microphones is connected to the XLR type inputs when turning phantom power on. Applying phantom power to equipment other than phantom-powered microphones can damage the equipment. The exception to this rule is balanced dynamic microphones, which can safely be left connected while phantom power is applied to the XLR inputs.
- To minimize the possibility of speaker damage, turn phantom power on ONLY while your power amplifier or powered speakers are switched off. It's also a good idea to turn the mixers output controls—the ST Master LEVEL Control and Channel LEVEL Controls—all the way down when turning phantom power on.

#### NOTE

The first time you connect to the computer's USB connector, or change the connection to a different USB port, a driver installation display may appear. If this occurs, wait until the installation is complete before proceeding.

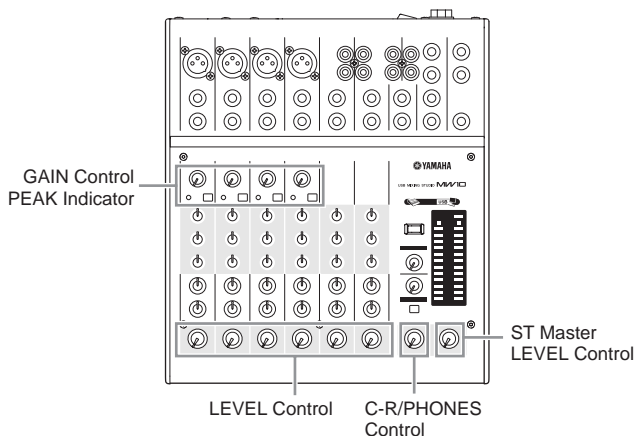


Step

## 4 Adjusting Level and Equalization

### Level Adjustment

- 1** The first step in adjusting levels is to set the level controls on all instruments and other sources appropriately.
- 2** Adjust the channel GAIN controls so that the corresponding peak indicators flash briefly on the highest peak levels (GAIN controls are not provided on the stereo channels—7/8 and 9/10).
- 3** Raise the ST Master LEVEL Control to the “◀” position.
- 4** Adjust the Channel LEVEL Controls to create the desired initial balance while monitoring via headphones or monitor speakers. The overall headphone level is adjusted by the C-R/PHONES control.



### EQ Adjustment

The MW10 mixer's 3-band equalizers with independent HIGH, MID, and LOW bands make it easy to shape the tone of independent channels to achieve the best possible mix.

#### Use the High-pass Filter for Microphone Input

As the name implies, a "high-pass filter" allows only signals above a certain frequency to pass. Conversely, signals below that "cutoff frequency" are attenuated. When an MW10 high-pass filter is turned on, signals below 80 Hz are attenuated. This can be useful for minimizing low-frequency breath noise from a vocalist, as well as handling noise, or rumble transmitted via the microphone stand. It is generally a good idea to turn the high-pass filter on for microphone channels.

#### Equalizer Tips

The best advice that can be given regarding equalization while recording is simply to use as little equalization as possible. If you want a little more presence you can turn the HIGH end up a bit. Or you can boost the bass a little if you feel the low end is lacking. During recording it's better to use EQ sparingly for compensation only.

Step

## 5 Recording with Cubase LE

This section describes the procedure for recording via the MW10 mixer to the Cubase LE software we installed earlier.

**NOTE** For details on operation of the Cubase LE software refer to the pdf-format manual provided with the software.

### Cubase LE Setup

- 1 To prevent the playback sound from Cubase LE from being directly re-recorded, press the MW10 2TR IN/USB (ST/TO C-R) switch so that it's in the on (TO C-R) position.

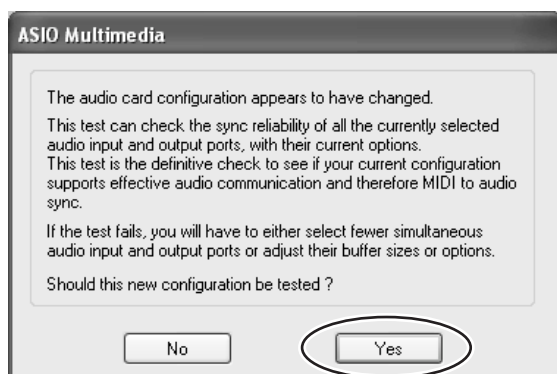
With the setting the playback sound can be monitored via the C-R OUT connectors as well as the PHONES jack.



## 2 Launch Cubase LE.

### Windows:

Click [Start] → [All Programs] → [Steinberg Cubase LE] → [Cubase LE] to launch the program. If the ASIO Multimedia dialog window appears, click [Yes].



### Macintosh:

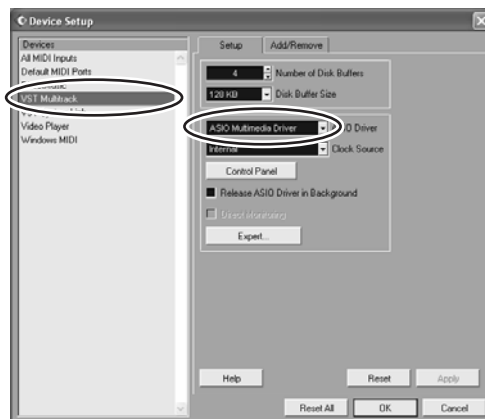
Double click the [Cubase LE] icon in your "Applications" folder, or single-click the [Cubase LE] icon in the dock if it has been placed there.

- NOTE**
- If you specified a file destination when installing the Cubase LE software, launch the application from that location.
  - Create a Cubase LE shortcut or Alias on your desktop so you can easily launch the program when required.

- 3 Select [Device Setup] from the [Devices] menu to open the Device Setup window.

### Windows:

Select [VST Multitrack] in the [Devices] field on the left side of the window. Select [ASIO Multimedia Driver] in the [ASIO Driver] field on the right side of the window, and click [Apply].

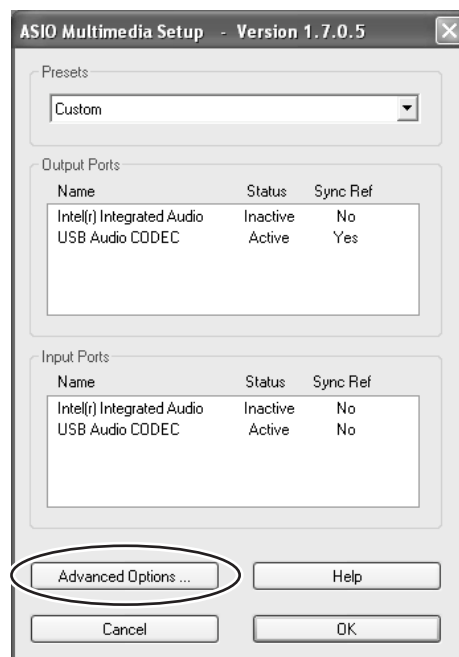


### Macintosh:

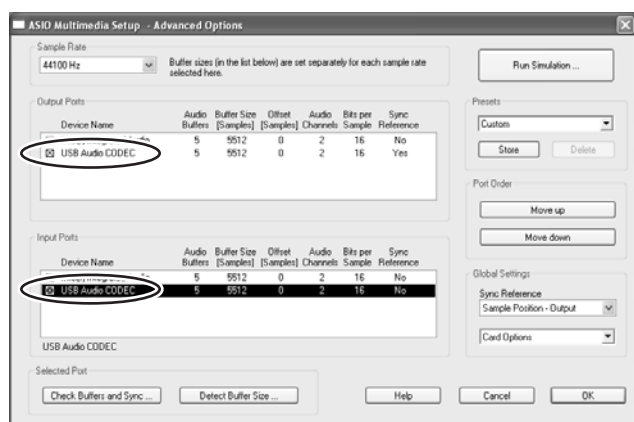
Select [VST Multitrack] in the [Device] field on the left side of the window. Select [USB Audio CODEC (2)] in the [ASIO Driver] field on the right side of the window, and click [OK]. Skip ahead to step 7, below.

- NOTE** Under Mac OS X you can select either [USB Audio CODEC (1)] or [USB Audio CODEC (2)] in the [ASIO Driver] driver field. Normally you should select or [USB Audio CODEC (2)], but if you will only be playing back and mixing previously recorded data you can select [USB Audio CODEC (1)] to lighten the load on the computer's CPU.

- 4 On a Windows computer click [Control Panel] in the Device Setup window. The ASIO Multimedia Setup dialog window will appear. Click [Advanced Options].



- 5** The ASIO Multimedia Setup – Advanced Options window will appear. Check only the input port and output port [USB Audio CODEC] checkbox.



- 6** Click [OK] in the ASIO Multimedia Setup – Advanced Options, ASIO Multimedia Setup, and Device Setup dialog windows to close the windows.

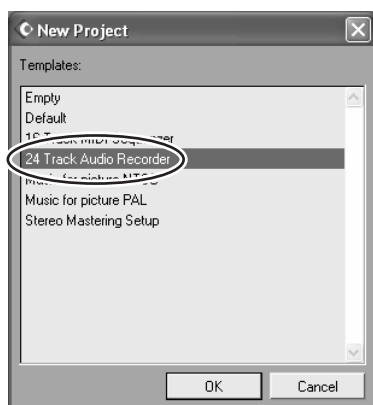
- 7** Select [VST Inputs] in the [Devices] menu. The VST Inputs window will open. Engage the Port [USB Audio CODEC] Active button (⏻), and close the VST Inputs window.



- 8** Select [New project] from the [File] menu to create a new project file.

The New Project dialog window will open. For this example select [24 Track Audio Recorder] and click [OK].

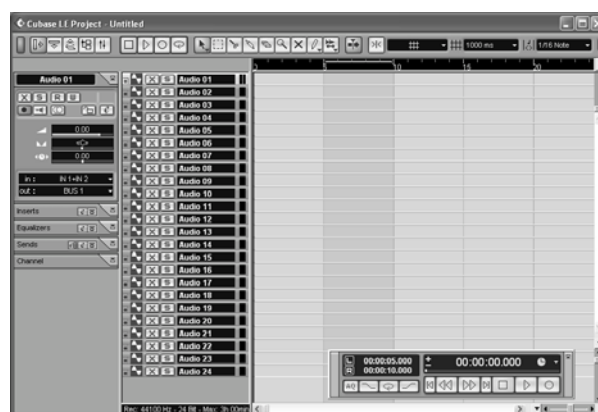
**NOTE** Recorded Cubase LE data is stored as a "project file" for each song.



- 9** When the directory selection dialog window appears, select the folder to which the project and audio files for the project are to be stored, and click [OK].



An empty 24-audio-track project window will appear.

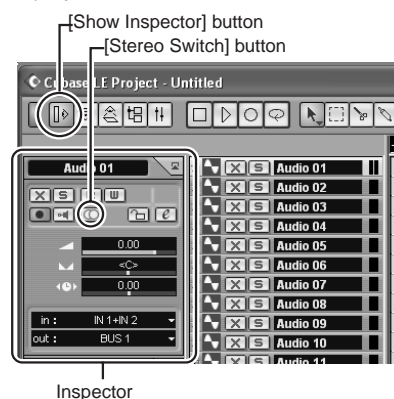


## Preparing to Record

- 1** Click in the track list (the area in which the track names are displayed) to select a track to record on.

For this example select [Audio 01]. The various settings for the selected track are available in the Inspector on the left side of the display.

**NOTE** If the Inspector is not showing, click the [Show Inspector] button (⏻) in the upper left area of the project window.



Inspector

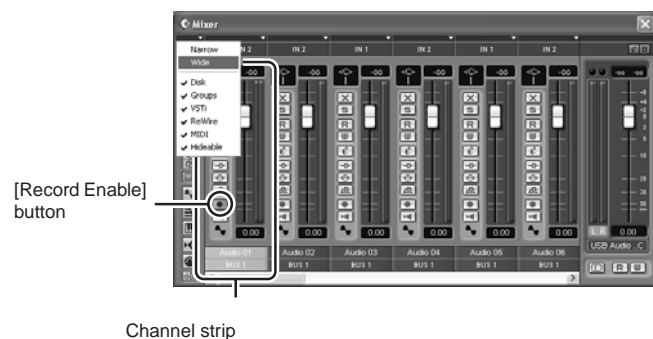
## 2 Use the [Stereo Switch] buttons in the Inspector to select stereo or monaural operation for the track: (◻) for stereo operation and (◻) for monaural.

For the example select the stereo mode.

You will normally use a monaural track when recording vocals or guitar, and a stereo track when recording synthesizers with stereo outputs, for example. You might want to use a stereo track to record a guitar processed through a preamplifier or amp simulator with stereo outputs.

## 3 Select [Mixer] from the [Devices] menu to open the mixer window.

Click the arrow in the upper left corner of the mixer window and select [Wide] to increase the width of the mixer's channel strips. Leave the mixer window open until you have finished recording for easy access.



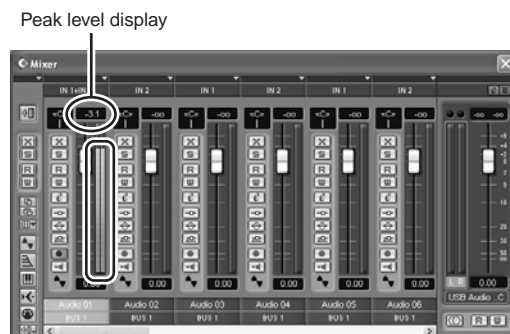
## 4 Make sure that the [Record Enable] button (◻) on the left side of the channel strip is on.

If the [Record Enable] button is off (◻), click it to turn it on. The input signal level will be displayed on the channel strip level meter while the [Record Enable] button is on.

## 5 Play the instrument to be recorded and, while watching the mixer window level meter, adjust the MW10 GAIN controls, Channel LEVEL Controls, and ST Master LEVEL Control so that the meter never goes above 0.0 dB.

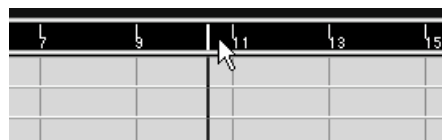
**NOTE** The Cubase LE channel strip fader only affects the playback output level from Cubase LE.

The maximum level encountered is displayed numerically in the peak level display at the top of the channel strip.



## 6 Specify the point at which you want to start recording via the ruler at the top of the project window.

Click the black area of the ruler to move the project cursor (the vertical black line) to that position.



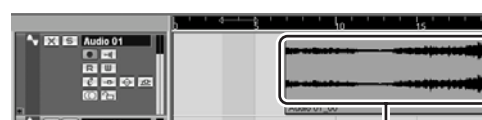
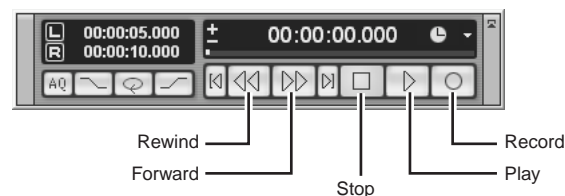
## 7 Open the [Transport] menu and turn [Start Record at Left Locator] off.

### Recording and Playback

#### 1 Click the Transport panel [Record] button to begin recording.

When recording is started the project cursor will begin moving to the right and a box that displays the recording results will be created.

##### Transport panel



Recording results

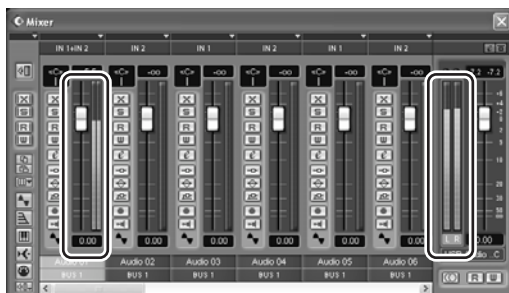
#### 2 Play the part.

#### 3 When you have finished recording the track, click the Transport panel [Stop] button.

- 4** To hear playback of the track you have just recorded, use either the Transport panel [Rewind] button or the ruler to rewind to the beginning of the recorded section, then click the Transport panel [Play] button.

The playback level will be displayed via the master section level meter on the right side of the Mixer window. The channel strip level meters will become active when you turn the channel strip [Record Enable] button off.

**NOTE** When a pair of headphones are plugged into the MW10 PHONES jack, you can adjust the headphone listening level via the MW10 C-R/PHONES control and the 2TR IN/USB control.



- 5** To save the project file select [Save] from the [File] menu and enter a file name before actually saving the file.  
Save your project frequently to insure against losing large amounts of data if a problem occurs.
- 6** Repeat steps 1 through 5 to record further material on the same track.
- 7** To record additional material on a different track, select a new track and repeat the same record procedure.

Step

## 6 Mixing with Cubase LE

In this section we'll try mixing down multiple recorded audio tracks to stereo, and creating a wave file. Mixes can be stored as WAV or AIFF files, which can then be recorded to audio CDs.

- 1** Launch Cubase LE and open a project file.
- 2** Select [Mixer] from the [Devices] menu to open the mixer window.
- 3** Turn the [Record Enable] buttons for all recorded tracks off in order to display the corresponding levels via the channel-strip levels meters.
- 4** Click the Transport panel [Play] button.
- 5** Drag the channel strip faders up and down while listening to playback to adjust the mix as required.

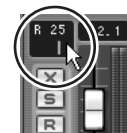
The master gain fader on the right side of the window can also be used to adjust the overall level.

### Start with the Featured Part

You can start working on a mix from almost any part, but it makes the most sense to start with the main instrument or vocal. Set up an initial level for the main part, and then build the rest of the mix around it.

For example, if you're mixing a piano trio with a vocalist, begin by setting the level of the vocal track at around the nominal level, and then gradually add the other instruments. Your choices will also be influenced by the type of music you are working on. If the song is a ballad you might want to add the piano to the mix after the vocal, and then add the bass and drums. If it's a more rhythmically oriented piece you could add the bass and drums first, and then the piano. Whatever best serves the music is right.


- 6** Drag the Pan controls on the left side of the channel strips left and right to set the stereo position of each track.



## Pan Effectively

"Panning" creates the illusion of stereo space by changing the relative levels of each track's signal sent to the left and right speakers. If a signal is sent only to the left speaker, the sound will appear to come from the far left side of the stereo sound field. If it sent with equal level to both left and right speakers our ears tell us the sound is located in the center of the stage. Judicious panning can also help to create cleaner-sounding mixes by spreading the instruments out across the sound stage so that they don't "get in each other's way." There are no hard and fast rules, but the bass and kick drum are usually placed in the center of the mix, as is the lead instrument or vocal. Other instruments should be evenly balanced throughout the sound stage in a well-balanced manner.

## 7 At this point you can begin to use EQ to refine your mix, and add effects.

As an example let's try adding reverb. Click the [Edit VST channel] button () on the left side of the channel strip to open the VST Channel Settings window. Click No Effect → Reverb → Reverb B.

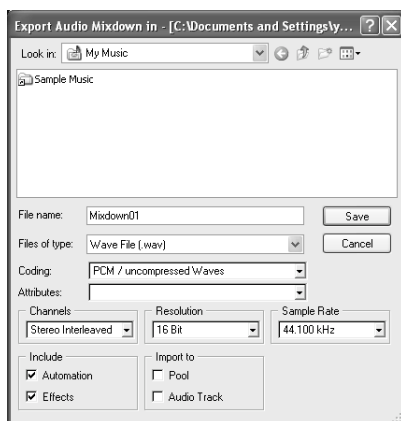
**NOTE** For further details refer to the pdf manual provided with the Cubase LE software.



It's a good idea to lower the channel fader a bit before adding an effect, since the effect can cause an increase in the overall channel level.



## 8 When the final adjustments have been made to the mix, go to the [File] menu and select [Export] → [Audio Mixdown].



## 9 Enter a file name and select a file type.

If you intend to use the file to create an audio CD, select the WAV file type (AIFF on a Macintosh), Stereo Interleaved, 16 bit, and 44.1 kHz.

## 10 Click [Save].

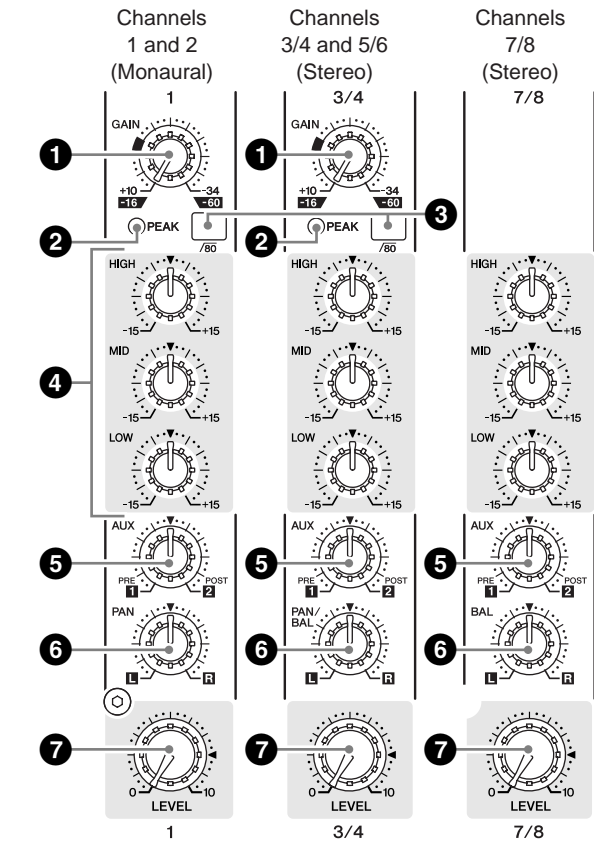
Progress of the mixdown operation will be shown in a progress window. When the progress window closes the mixdown is complete.

**NOTE** Wave files created by mixdown can be directly playback back using the Windows Media Player or iTunes on a Macintosh computer.



# Front & Rear Panels

## Channel Control Section



### 1 GAIN Control

Adjusts the input signal level. To get the best balance between the S/N ratio and the dynamic range, adjust the level so that the PEAK indicator (2) comes on only at about maximum input level. The -60 to -16 scale indicates the MIC input adjustment level. The -34 to +10 scale indicates the LINE input adjustment level.

### 2 PEAK Indicator

Detects the peak level of the post-EQ signal, and lights up red when the level reaches 3 dB below the clipping level. For XLR-equipped stereo input channels (3/4 and 5/6), detects both post-EQ and post-mic-amp peak levels, and lights red if either of these levels reaches 3 dB below the clipping level.

**NOTE** When the level of an input signal exceeds the level that can be handled by the mixer's head amp or equalizer, distortion and noise will result. The PEAK indicators are used to visually check the signal level to ensure no overload occurs.

### 3 /80 Switch (High Pass Filter)

This switch toggles the HPF on or off. To turn the HPF on, press the switch in ( — ). The HPF cuts frequencies below 80 Hz. (But note that regardless of the switch setting, the mixer does not apply this HPF to the line inputs of stereo input channels.)

### 4 Equalizer (HIGH, MID, and LOW)

This three-band equalizer adjusts the channel's high, mid, and low frequency bands. Setting the knob to the ▼ position produces a flat frequency response. Turning the knob to the right boosts the corresponding frequency band, while turning to the left attenuates the band. The following table shows the EQ type, base frequency, and maximum cut/boost for each of the three bands.

Band	Type	Base Frequency	Maximum Cut/Boost
HIGH	Shelving	10 kHz	±15 dB
MID	Peaking	2.5 kHz	
LOW	Shelving	100 Hz	

**NOTE** The equalizer can be used to boost or cut specific frequency bands, allowing the tone of the sound to be shaped as required by the mix.

### 5 AUX Controls

Use the AUX control to send the channel's signal to the AUX1 or AUX2 bus. Turn the knob to the left of the "▼" mark to feed the signal to the AUX1 bus, or to the right of the "▼" to feed to the AUX2 bus. The volume of the feed increases as you move the knob away from the "▼" position. If you set the knob exactly to the "▼" position, the mixer will not send the signal to either of the AUX buses. Note that the signal to the AUX1 bus is a pre-fader signal, and is not affected by the channel LEVEL controls. The signal to the AUX2 bus is a post-fader signal, and will always pass through the channel LEVEL controls before moving to the bus. If you are using stereo channels, the signals from the L (odd) and R (even) channels are mixed and sent to the AUX1 and AUX2 buses.

### 6 PAN Control (CHs 1 and 2) PAN/BAL Control (CHs 3/4 and 5/6) BAL Control (CHs 7/8, 9/10)

The PAN control determines the positioning of the channel's signal on the Stereo L and R buses. The BAL control knob sets the balance between left and right channels. Signals into the L input (odd channel) feed to the Stereo L bus; signals into the R input (even channel) feed to the Stereo R bus.

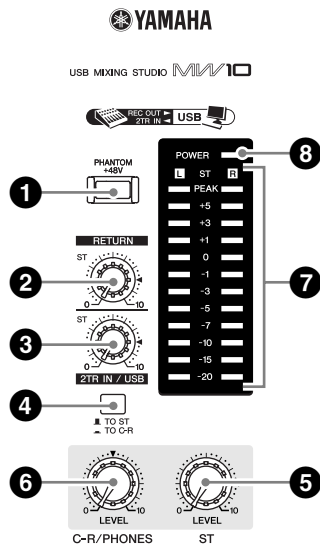
**NOTE** On channels where this knob provides both PAN and BAL controls: The knob operates as a PAN control if you are inputting through the MIC jack or into the L (MONO) input only, and operates as a BAL control if you are inputting into both L and R inputs.

### 7 Channel LEVEL Control


Adjusts the output level of the signal being input to the channel. Use these LEVEL Controls to adjust the volume balance among the various channels.

**NOTE** To reduce noise, set the LEVEL Control knobs for unused channels all the way to the left (to the minimum setting).

## Master Control Section





### 1 PHANTOM +48 V Switch

This switch toggles phantom power on and off. If you set the switch on, the mixer supplies power to all channels that provide XLR mic input jacks (CHs 1, 2, 3/4, 5/6). Set this switch on (  ) when using one or more condenser microphones.

**NOTE** When this switch is on, the mixer supplies DC +48 V power to pins 2 and 3 of all XLR-type MIC INPUT jacks.



- Be sure to leave this switch off (  ) if you do not need phantom power.
- When tuning the switch on (  ), be sure that only condenser mics are connected to the XLR input jacks (CHs: 1 to 5/6). Devices other than condenser mics may be damaged if connected to the phantom power supply. Note, however, that the switch may be left on without problem when connecting to balanced dynamic microphones.
- To avoid damage to speakers, be sure to turn off amplifiers (or powered speakers) before turning this switch on or off. We also recommend that you turn all output controls (ST Master LEVEL Control, etc.) to minimum settings before operating the switch, to avoid risk of loud noises that could cause hearing loss or device damage.

### 2 RETURN Control

Adjusts the level of the signal sent from the RETURN jacks (L (MONO) and R) to the Stereo bus.

**NOTE** If you supply a signal to the RETURN L (MONO) jack only, the mixer outputs the identical signal to both the L and R Stereo buses.

### 3 2TR IN/USB Control

Adjusts the level of signals received via 2TR IN, as well as the level of signals received by the MW10 from the computer via the USB interface.

### 4 2TR IN/USB Switch (TO ST/TO C-R)

Determines whether the stereo signal received via the 2TR IN connectors or USB interface is sent to the stereo bus or the C-R OUT connectors and PHONES jack (level meter).

- NOTE**
- When the 2TR IN/USB switch is set to TO ST, the signal input via the 2TR IN/USB connector is added to the stereo bus.
  - When the 2TR IN/USB switch is set to TO C-R, the signal input via the 2TR IN/USB connector is directly sent to the C-R OUT/PHONES connector, and is not output via the stereo bus.

### 5 ST Master LEVEL Control

Adjusts the signal level to the ST OUT jacks.

### 6 C-R/PHONES LEVEL Control

Controls the level of the signal output to the PHONES jack and the C-R OUT L and R jacks.

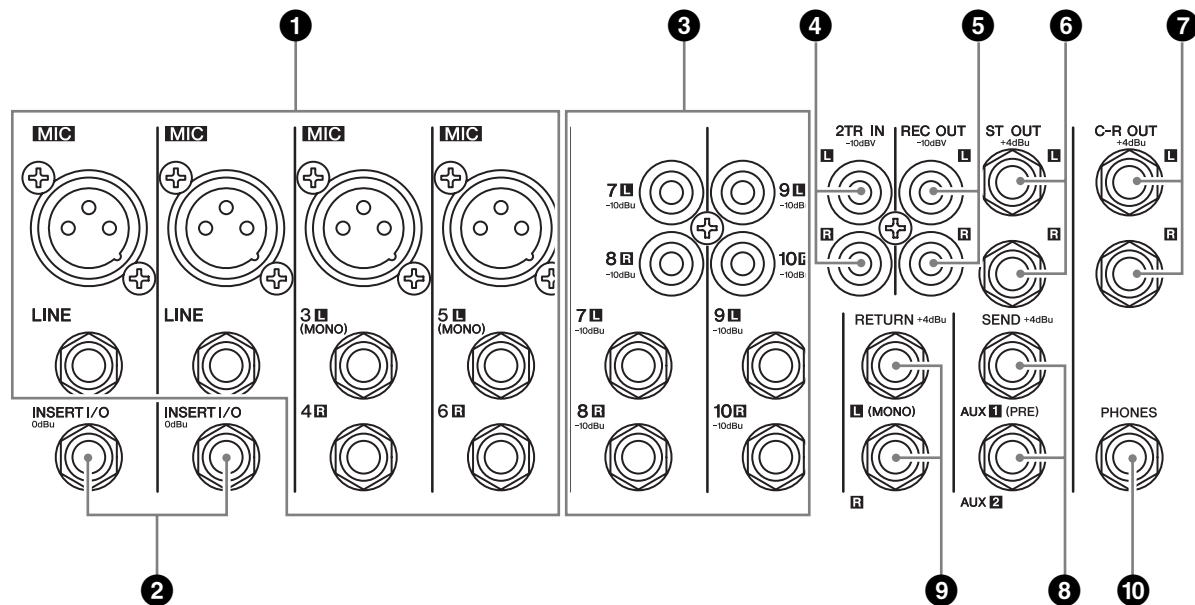
### 7 Level Meter

This LED display shows the level of the signal fed to the Stereo bus. The “0” point corresponds to the standard output level. The indicator lights up red when the output hits the clipping level.

### 8 POWER Indicator

This indicator lights up when the mixer's power is ON.

## Input/Output Section



### 1 Channel Input Jacks (CHs 1, 2, 3/4, 5/6)

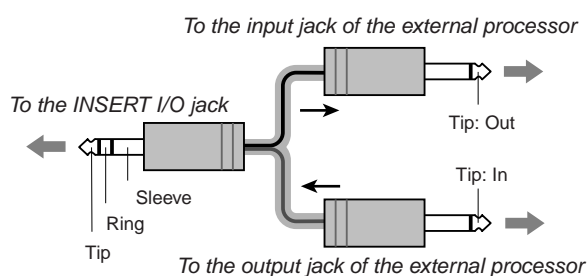
- **MIC jacks**  
These are balanced XLR-type input jacks (1:Ground; 2:Hot; 3:Cold).
- **LINE jacks**  
These are balanced phone-type input jacks. You can connect either balanced or unbalanced phone plugs to these jacks.

**NOTE** Where an input channel provides both a MIC jack and a LINE jack, you may use either one of these jacks but you may not use both at the same time. Please connect to only one of these jacks on each channel.

### 2 INSERT I/O Jacks (CHs 1 and 2)

These are unbalanced phone-type input/output jacks. Each of these jacks is positioned between the equalizer and Channel LEVEL Control of the corresponding input channel. These jacks can be used to independently connect these channels to devices such as graphic equalizers, compressors, and noise filters. These are TRS (tip, ring, sleeve) phone jacks that support bidirectional operation.

**NOTE** Connection to an INSERT I/O jack requires a special separately-sold insertion cable such as illustrated below.



**NOTE** The signal output from the INSERT I/O jacks is reverse-phased. This will not be a problem if connecting the jack to an effector. If using the jack to output to an external device, however, please be aware of possible phase conflicts with other signals.

### 3 Channel Input Jacks (CHs 7/8, 9/10)

Each of these channel pairs can be used to input a stereo source signal. For each pair, the odd-numbered channel inputs the L signal, and the even-numbered channel inputs the R signal. Each channel offers a choice of two jack types: phone jack and RCA pin jack. All of these jacks are unbalanced.

**NOTE** Where a channel provides both phone jacks and RCA pin jacks, you may use either one of these jacks but you may not use both at the same time. Please connect to only one of these jacks on each channel.

### 4 2TR IN Jacks

These are unbalanced RCA-pin input jacks. Use these jacks when you want to connect a stereo sound source (CD, DAT, etc.) directly to the mixer for monitoring.

- NOTE**
- You can adjust the signal level using the 2TR IN/USB control in the Master Control section.
  - When a signal is being received both via the 2TR IN connectors and the USB interface, the received signals are mixed.

### 5 REC OUT (L, R) Jacks

These are unbalanced RCA-pin output jacks. These jacks output the mixed signal whose level is controlled by the ST Master LEVEL Control. You use these jacks, for example, to connect to an external recorder.

**NOTE** These connectors output the same signal that sent to the computer via the USB interface.

## Front & Rear Panels

### 6 ST OUT (L, R) Jacks

These are impedance-balanced phone-type output jacks. These jacks output the mixed signal whose level is controlled by the ST Master LEVEL Control. You use these jacks, for example, to connect to the power amplifier driving your main speakers.

### 7 C-R OUT Jacks

These are impedance-balanced phone-type output jacks. These jacks output the mixed signal whose level is controlled by the C-R/PHONES LEVEL Control. You use these jacks, for example, to connect to the powered speaker.

**NOTE** When the 2TR IN/USB switch is set to TO C-R, the signal input via the 2TR IN/USB connector and the stereo bus signal are mixed and output via the C-R OUT/PHONES connector.

### 8 SEND Jacks

#### • AUX1, AUX2

These are impedance balanced phone-type output jacks.

These jacks output the signals from AUX1 and AUX2, respectively. You use these jacks, for example, to connect to an effector or monitor system.

### 9 RETURN L (MONO), R Jacks

These are unbalanced phone-type input jacks. The signal received by these jacks is sent to the Stereo bus. These jacks are typically used to receive a return signal from an external effector (reverb, delay, etc.).


**NOTE** These jacks can also be used as an auxiliary stereo input. If you connect to the L (MONO) jack only, the mixer will recognize the signal as monaural and will propagate the identical signal on both L and R jacks.

### 10 PHONES Jack

Connector for headphones. This is a stereo phone-type output jack.

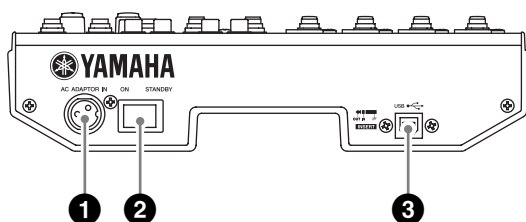
**NOTE** When the 2TR IN/USB switch is set to TO C-R, the signal input via the 2TR IN/USB connector and the stereo bus signal are mixed and output via the C-R OUT/PHONES connector.

## Connector Polarities

		INPUT OUTPUT
MIC INPUT	Pin 1: Ground Pin 2: Hot (+) Pin 3: Cold (-)	 
LINE INPUT (monaural channels), ST OUT, C-R OUT, AUX1, AUX2*	Tip: Hot (+) Ring: Cold (-) Sleeve: Ground	
INSERT I/O	Tip: Output Ring: Input Sleeve: Ground	
PHONES	Tip: L Ring: R Sleeve: Ground	
RETURN, LINE INPUT (stereo channels)	Tip: Hot Sleeve: Ground	

\* These jacks will also accept connection to monaural phone plugs. If you use monaural plugs, the connection will be unbalanced.

## Rear Section



### 1 AC ADAPTOR IN Connector

Connects to the included PA-10 power adaptor (see page 6).



Use only the PA-10 adaptor included with this mixer. Use of a different adaptor may result in fire or electric shock.

### 2 POWER Switch

Use this switch to set mixer power to ON or STANDBY.



Note that trace current continues to flow while the switch is in the STANDBY position. If you do not plan to use the mixer again for a long while, be sure to unplug the adaptor from the wall outlet.

### 3 USB Connector

Connects to the computer via the supplied USB cable.



When connecting or disconnecting the USB cable be sure to turn the 2TR IN/USB control all the way down.

# Setting Up

## Setup Procedure

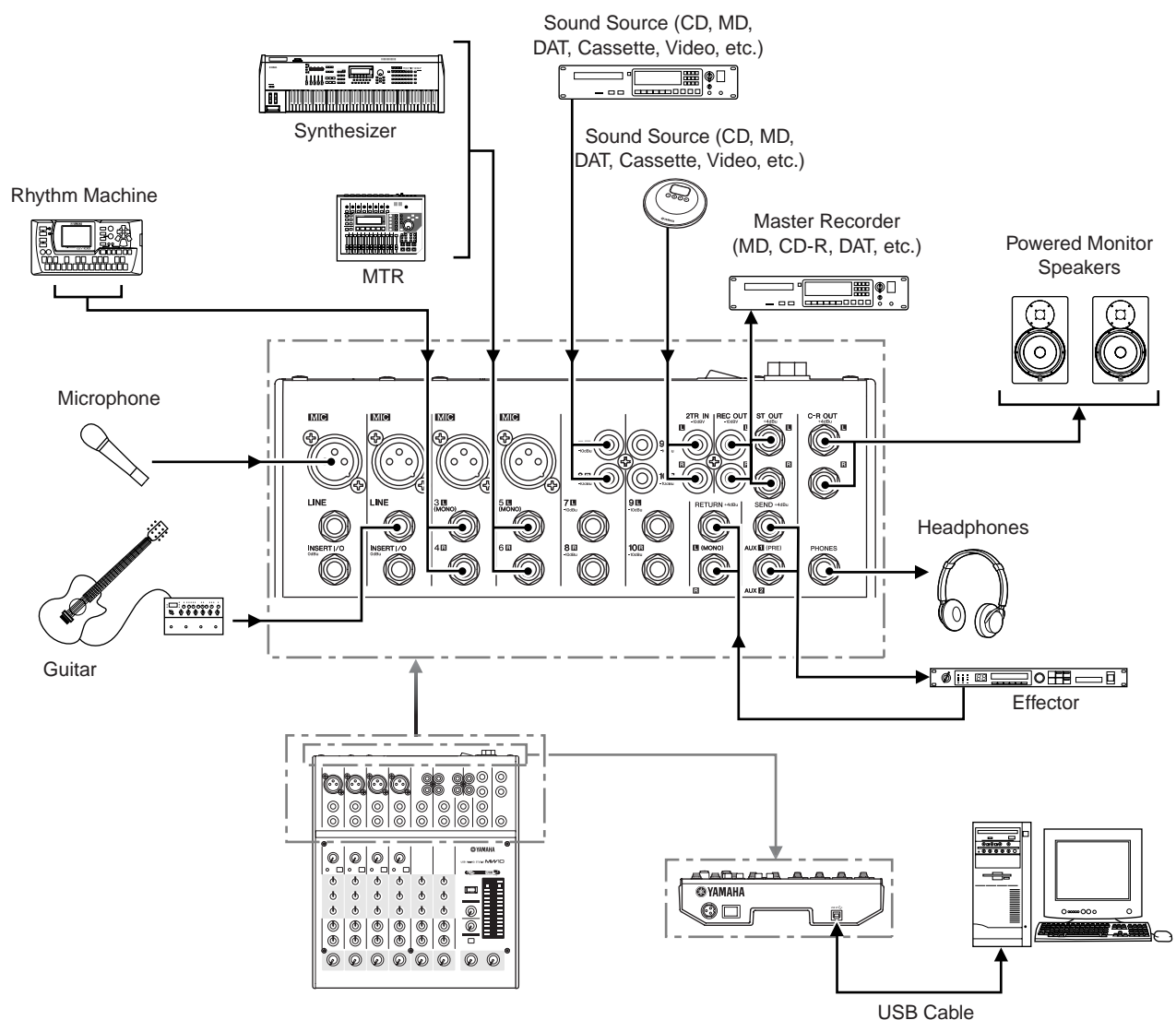
- 1** Before connecting to microphones and instruments, be sure that all devices are turned off. Also be sure that all of the channel controls and all of the controls in the Master Control section are turned to their minimum settings.
- 2** For each connection, connect one end of the cable to the relevant microphone or instrument and connect the other end to the appropriate input jack on the mixer.

**NOTE** Where an input channel provides both a MIC INPUT jack and a LINE INPUT jack, you may use either one of these jacks but you may not use both at the same time. Please connect to only one of these jacks on each channel.

- 3** To avoid causing damage to speakers, power up the devices in the following order: **Peripheral devices → mixer → power amps (or powered speakers).**

**NOTE** When shutting the system down, turn off the power in the opposite order: Power amps (powered speakers) → mixer → peripheral devices.

## Setup Examples





# Troubleshooting

## The MW10 mixer won't turn on.

- Is the supplied power adaptor properly plugged into both the mixer and an appropriate AC wall outlet?

## The system doesn't work properly.

- Are the USB cable and all necessary audio cables properly connected?
- Are you using a USB hub?  
USB hubs can interfere with proper operation, so try connecting the MW10 directly to a USB port on the computer. If the computer has multiple USB ports, try a different USB port.
- Are you using other USB devices at the same time?  
If so, try removing the other device(s) and connecting only the Yamaha USB device.

## No sound.

- Are your speaker cables connected properly, or are they shorted?
- Are the volume controls of your sources, audio devices, applications software, computer operating system, etc., set at appropriate levels?
- Is the output of your computer operating system muted?
- Do you have several applications running at the same time?  
Be sure to quit all applications you are not using.
- Is the sound output of your computer operating system assigned properly?

### Windows:

- 1 From the [Start] menu click [Control Panel], then double-click "Sounds and Audio Devices" icon to open the "Sounds and Audio Devices Properties" dialog window.
- 2 Click the "Audio" tab.
- 3 Set "Sound playback: Default device" and "Sound recording: Default device" to "USB Audio CODEC."
- 4 Click [OK].

### Macintosh:

- 1 Select [System Preferences ...] from the Apple menu and then select "Sound" to open the "Sound" dialog window.
  - 2 Click the "Input" tab and under "Choose a device for sound input" select "USB Audio CODEC."
  - 3 Click the "Output" tab and under "Choose a device for sound output" select "USB Audio CODEC."
- Is the sound output of the Cubase LE application assigned properly?  
For setup details refer to page 10 of the Quick Guide.

## The recorded sound is too low in level.

- Is the computer's output level setting too low?  
We recommend that you set the computer output to the maximum level.

### Windows:

- 1 From the [Start] menu click [Control Panel], then double-click "Sounds and Audio Devices" icon to open the "Sounds and Audio Devices Properties" dialog window.
- 2 Double click the "Volume" tab.
- 3 Set "Device volume" to "High".

### Macintosh:

- 1 Select [System Preferences ...] from the Apple menu and then select "Sound" to open the "Sound" dialog window.
  - 2 Click the "Output" tab and set the volume slider at the bottom of the window to its maximum level.
- Have you connected or disconnected the USB cable while Cubase LE is running?  
Doing so can sometimes cause the Windows output level to be reset to its default level. Check and raise the output level if necessary.

## The sound is intermittent or distorted.

- Is the PEAK indicator flashing red?  
You might have to lower GAIN control or channel LEVEL control levels to avoid distortion.
- Does the computer you are using meet the listed system requirements?  
Refer to "System Requirements" on page 6 for details.
- Are any other applications, device drivers, or USB devices (scanners, printers, etc.) running at the same time?  
Be sure to quit all applications you are not using.
- Are you playing back a large number of audio tracks?  
The number of tracks you can play at the same time will depend on the performance of the computer you are using. You may experience intermittent playback if you exceed your computer's capabilities.

- **Are you recording or playing long continuous sections of audio?**

The audio data processing capabilities of your computer will depend on a number of factors including CPU speed and access to external devices.

On Windows computers, changing some settings as outlined below can improve performance.

- 1 Click [Control Panel] from the [Start] menu, and double click the "Sounds and Audio Devices" icon to open the "Sounds and Audio Devices Properties" dialog.
- 2 Click the "Volume" tab and click [Advanced] in "Speaker Settings". The "Advanced Audio Properties" dialog will open.
- 3 Click the "Performance" tab. Set "Hardware Acceleration" to "Full", and "Sample Rate Conversion Quality" to "Good."

Don't change these settings if you are not familiar with your computer's operating system.

Check that the file system is set properly, and make sure that you have a plenty of free memory (more than 128 MB). If the wave files you are recording or playing are not too large, changing the virtual memory settings can sometimes improve audio performance. In some cases it might be necessary to update your hard disk controller, device drivers, or BIOS. Refer to your computer's support center or support page on the web for more information.

- **Try adding memory.**

Adding more RAM memory can significantly increase your computer's audio performance. Refer to your computer's owner's manual for information on installing and setting up extra memory.

### **There is a delay when playing a software synthesizer via a MIDI keyboard (latency).**

- Check the URL listed below for the latest information.  
<http://www.yamahasynth.com/>

# Appendix

## Specifications

### ■ Electrical Characteristics

	Conditions	MIN	TYP	MAX	UNIT
<b>Total Harmonic Distortion</b> (MIC to ST OUT)	(THD+N) 20 Hz - 20 kHz @ +14 dBu 10k ohms, GAIN controls at minimum level, all level controls at nominal level			0.1	%
<b>Frequency Response</b> (CH INPUT 1-9/10, RETURN, 2TR IN to ST OUT, AUX SEND, C-R OUT, REC OUT)	20 Hz-20 kHz, nominal output level @ 1 kHz, 10 k ohms, GAIN controls at minimum level (CH INPUT 1-5/6), all level controls at nominal level	-3	0	1	dB
<b>Hum &amp; Noise</b> Rs=150 ohms, Gain=Maximum (CH INPUT 1-2), Hum & Noise are measured with a -6 dB/octave filter @12.7 kHz; equivalent to a 20 kHz filter with infinite dB/octave attenuation.	Equivalent Input Noise (CH INPUT 1-2 MIC)			-128	dBu
	Residual Output Noise (10 k ohms (ST OUT))			-100	dBu
	ST master control at nominal level and all channel LEVEL controls at minimum level. (ST OUT)			-87 (91 dB S/N)	dBu
	All channel AUX controls at minimum level. (AUX SEND)			-85 (89 dB S/N)	dBu
	ST master control and one channel LEVEL control at nominal level. (CH INPUT 1, 2) (ST OUT)			-64 (68 dB S/N)	dBu
<b>Maximum Voltage Gain</b> 1 kHz, 10k ohms PAN/BAL: panned hard left or hard right.	CH INPUT 1, 2 MIC to CH INSERT OUT, Rs=150 ohms, GAIN controls at maximum level		60		dB
	CH INPUT 1-5/6 MIC to ST OUT, Rs=150 ohms, GAIN controls at maximum level		76		dB
	CH INPUT 1-5/6 MIC to REC OUT, Rs=150 ohms, GAIN controls at maximum level		64.2		dB
	CH INPUT 1, 2 MIC to AUX SEND, Rs=150 ohms, GAIN controls at maximum level, PRE		70		dB
	CH INPUT 1, 2 MIC to AUX SEND, Rs=150 ohms, GAIN controls at maximum level, POST		76		dB
	CH INPUT 3/4-5/6 LINE to ST OUT, Rs=150 ohms, GAIN controls at maximum level		50		dB
	CH INPUT 3/4-5/6 LINE to AUX SEND, Rs=150 ohms, GAIN controls at maximum level, PRE		41		dB
	CH INPUT 3/4-5/6 LINE to AUX SEND, Rs=150 ohms, GAIN controls at maximum level, POST		47		dB
	CH INPUT 7/8-9/10 to ST OUT, Rs=150 ohms, GAIN controls at maximum level		26		dB
	RETURN to ST OUT, Rs=150 ohms		12		dB
	2TR IN to ST OUT, Rs=600 ohms		23.8		dB
<b>Crosstalk (1 kHz)</b>	Adjacent inputs			-70	dB
	input to output			-70	dB

Where 0 dBu = 0.775 Vrms

Output impedance of signal generator: 150 ohms

### ■ General Specifications

<b>Monaural/Stereo CH High Pass Filter</b>	80 Hz 12 dB/octave
<b>Monaural/Stereo CH Equalization</b> Turn over/roll-off frequency of shelving, 3 dB below maximum variable level	±15 dB (Max. Variation) HIGH: 10 kHz (shelving) MID: 2.5 kHz (peaking) LOW: 100 Hz (shelving)
<b>Phantom Power</b>	Supplied when Phantom +48 V switch is ON. (XLR-type input jacks)
<b>Monaural/Stereo Input PEAK Indicator</b>	On each channel: red indicator lights if post-EQ signal (on stereo channels, if either post-EQ signal or post-mic-amp signal) comes within 3 dB of the clipping level.
<b>USB Audio</b>	Input/Output: 44.1/48 kHz
<b>Included Accessories</b>	Power adaptor (PA-10), CD-ROM, USB cable
<b>Power Consumption</b>	19 W
<b>Dimensions (W × H × D)</b>	251 mm × 65 mm × 290.5 mm
<b>Net Weight</b>	1.8 kg
<b>Temperature Range</b>	Operating temperature: 0 to 40 °C, Storage temperature: -20 to 60 °C

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## ■ Analog Input Specifications

Input Connector	Gain	Input Impedance	Appropriate Impedance	Sensitivity*	Nominal Level	Max. Before Clipping	Connector Specifications
MIC INPUT (CH 1, 2)	–60	3 k ohms	50–600 ohms mic	–72 dBu (0.195 mV)	–60 dBu (0.775 mV)	–40 dBu (7.75 mV)	XLR-3-31 type (balanced)
	–16			–28 dBu (30.8 mV)	–16 dBu (123 mV)	+4 dBu (1.23 V)	
LINE INPUT (CH 1, 2)	–34	10 k ohms	600 ohms line	–46 dBu (3.88 mV)	–34 dBu (15.5 mV)	–14 dBu (155 mV)	Phone jack (TRS) (balanced [T: hot; R: cold; S: ground])
	+10			–2 dBu (0.615 V)	+10 dBu (2.45 V)	+30 dBu (24.5 V)	
ST CH MIC INPUT (CH3(L)/CH4(R), CH5(L)/CH6(R))	–60	3 k ohms	50–600 ohms mic	–72 dBu (0.195 mV)	–60 dBu (0.775 mV)	–40 dBu (7.75 mV)	XLR-3-31 type (balanced)
	–16			–28 dBu (30.8 mV)	–16 dBu (123 mV)	–10 dBu (245 mV)	
ST CH LINE INPUT (CH3(L)/CH4(R), CH5(L)/CH6(R))	–34	10 k ohms	600 ohms line	–46 dBu (3.88 mV)	–34 dBu (15.5 mV)	–14 dBu (155 mV)	Phone jack (unbalanced)
	+10			–2 dBu (0.615 V)	+10 dBu (2.45 V)	+30 dBu (24.5 V)	
ST CH INPUT (CH7(L)/CH8(R), CH9(L)/CH10(R))		10 k ohms	600 ohms line	–22 dBu (61.5 mV)	–10 dBu (245 mV)	+10 dBu (2.45 V)	Phone jack (unbalanced); RCA pin jack
CH INSERT IN (CH 1, 2)		10 k ohms	600 ohms line	–12 dBu (195 mV)	0 dBu (0.775 V)	+20 dBu (7.75 V)	Phone jack (TRS) (unbalanced [T: out; R: in; S: ground])
RETURN (L, R)		10 k ohms	600 ohms line	–8 dBu (308 mV)	+4 dBu (1.23 V)	+24 dBu (12.3 V)	Phone jack (unbalanced)
2TR IN (L, R)		10 k ohms	600 ohms line	–22 dBV (79.4 mV)	–10 dBV (316 mV)	+10 dBV (3.16 V)	RCA pin jack

Where 0 dBu=0.775 Vrms and 0 dBV=1 Vrms

\* Input sensitivity: the lowest level that will produce an output of +4 dBu (1.23V) or the nominal output level when the unit is set to maximum gain.  
(All level controls are maximum position.)

## ■ Analog Output Specifications

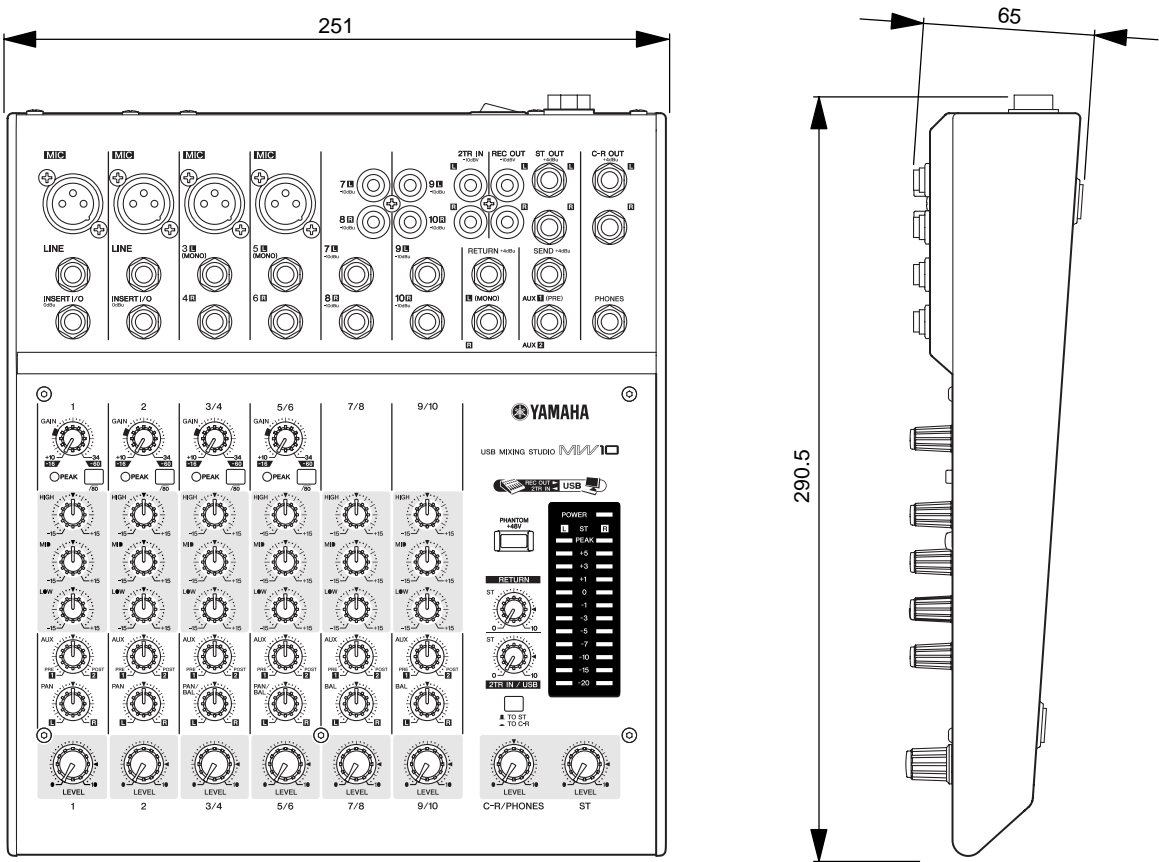
Output Connectors	Output Impedance	Appropriate Impedance	Nominal Level	Max. Before Clipping	Connector Specifications
ST OUT (L, R)	150 ohms	10 k ohms line	+4 dBu (1.23 V)	+20 dBu (7.75 V)	Phone jack (TRS) (balanced [T: hot; R: cold; S: ground])
AUX SEND (1, 2)	150 ohms	10 k ohms line	+4 dBu (1.23 V)	+20 dBu (7.75 V)	Phone jack (TRS) (impedance balanced [T: hot; R: cold; S: ground])
CH INSERT OUT (CH 1, 2)	150 ohms	10 k ohms line	0 dBu (0.775 V)	+20 dBu (7.75 V)	Phone jack (TRS) (unbalanced [T: out; R: in; S: ground])
REC OUT (L, R)	600 ohms	10 k ohms line	–10 dBV (316 mV)	+10 dBV (3.16 V)	RCA pin jack
C-R OUT (L, R)	150 ohms	10 k ohms line	+4 dBu (1.23 V)	+20 dBu (7.75 V)	Phone jack (TRS) (impedance balanced [T: hot; R: cold; S: ground])
PHONES	100 ohms	40 ohms phone	3 mW	75 mW	Stereo phone jack

Where 0 dBu=0.775 Vrms and 0 dBV=1 Vrms

## ■ Digital Input/Output Specifications

Connector	Format	Data Length	Connector Specification
USB	USB Audio 1.1	16 bit	USB B type

Dimensional Diagrams



Unit: mm

## Block Diagram and Level Diagram

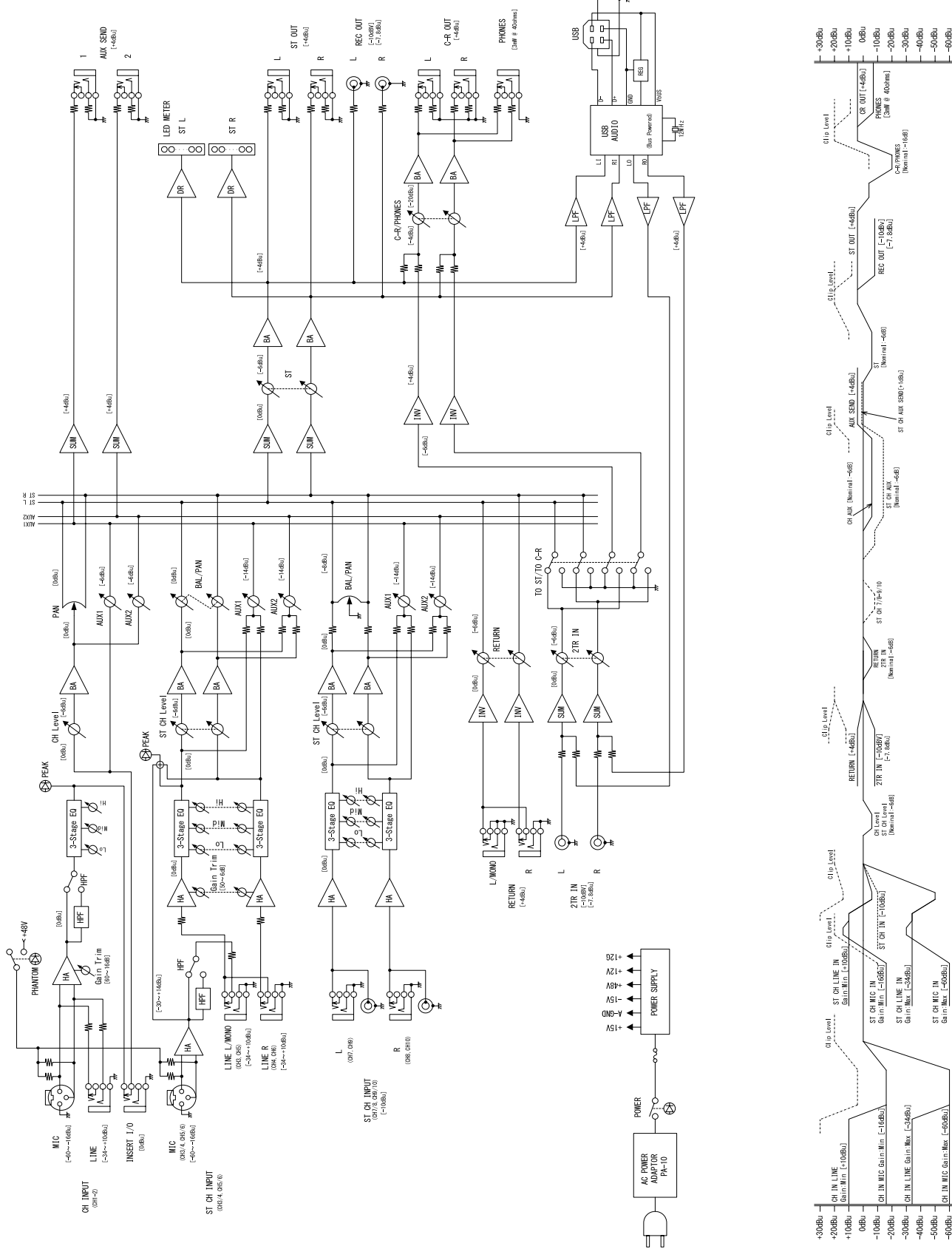


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Session Information	
Title:	Notes:
Date:	
Place:	

Mixer Setup

Source:	Source:	Source:	Source:	Source:	Source:	Source:	Source:	
1	2	3/4	5/6	7/8	9/10			
1	2	3/4	5/6	7/8	9/10	C-R/PHONES	ST	

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